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Group support system research in the 1990s: Leaders in research productivity

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ABSTRACT

Research using Group Support Systems has increased gradually from their beginning in 1984, and the area is a significant part of the overall MIS literature. Because of its importance, a few studies have attempted to identify the leading researchers and institutions in the area as well as trends over the years. This study updates the analysis with a survey of 236 papers published during the 1990s from 43 academic journals. The results show that many of the researchers identified earlier are still leaders, but individual rankings have changed.

INTRODUCTION

Group Support Systems (GSS) are used to automate meetings, and numerous studies using the systems for sharing ideas in large groups have shown that participants are more satisfied, efficient, and effective than when using traditional, oral techniques (Balacich, Dennis, & Connolly, 1994). Typically, a GSS provides facilities for exchanging comments and preferences anonymously and simultaneously while a transcript is recorded automatically to a disk file, although there are variations. Electronic mail and bulletin board systems bear similarities, but usually are not considered to be types of GSS (Morrison & Liu Sheng, 1992).

A significant amount of GSS literature is published in top MIS journals, and an analysis of progress and trends within the area may identify gaps in the research. Further, a review of leaders in the field provides an interesting vignette of productivity.

BACKGROUND

A few studies have attempted to map the progress of GSS research from their inception in 1984. For example, one study showed that 34% of the articles appearing in eight journals published in 1989 through 1990 used lab experiments, 17% used field studies, and 13% were classified as design and development papers (Zigurs, 1993), but approximately 65% of GSS studies up to 1998 used lab experiments. In a more recent study (Pervan, 1998), 234 GSS articles published from 1984 to 1996 in 13 journals (shown in Table 1) were analyzed. Results showed that 56% of the papers were empirical with 33% containing experiments and 15% containing case or field studies. In addition, the analysis identified the top institutions and individuals in the field (shown in Tables 2 & 3).

Table 1. Journals Reviewed in Pervan (1998) Study

1. Communications of the ACM
2. Data Base
3. Decision Science
4. Decision Support Systems
5. Group Decision and Negotiation
6. Information and Management
7. Interfaces
8. IS Research
9. Journal of MIS
10. Journal of Organizational Computing and Electronic Commerce
11. Management Science
12. MIS Quarterly
12. Small Group Research

Table 2. Top 10 GSS Institutions (Pervan, 1998)

1. University of Arizona
2. University of Georgia
3. University of Minnesota
4. Indiana University
5. New Jersey Institute of Technology
6. University of Mississippi
7. National University of Singapore
8. New York University
9. University of Texas, Austin
10. University of Colorado

Table 3. Top 10 GSS Authors (Pervan, 1998)

Normal Count Ranking	Adjusted Count Ranking
1. Nunamaker	Nunamaker
2. Dennis	Dennis
3. Vogel	Vogel
4. DeSanctis	DeSanctis
5. Shakun	Shakun
6. Bostrom	Bostrom
7. Valacich	Hiltz
8. Poole	Balacich
9. Aiken	Gallupe
10. George	Zigurs

The study contained two limitations, however. Although GSS research appears in many outlets, only 13 journals were surveyed. In addition, the study used two counting techniques: a 'Normal count' of authors and institutions and an "adjusted count" (one divided by the number of authors on the paper). Another technique based upon a geometric mean (discussed below) may reflect individual authors' contributions more accurately.

METHODOLOGY

In the first phase of the GSS research review, 43 academic, refereed journals (listed in Appendix 1) were scanned for articles related to the field over the period from January 1990 to December 1998. A bibliography of the 236 reviewed articles is provided at: <http://business.twsu.edu/index.html>

Authors and institutions were counted in three ways:

1. **Normal.** Each author or institution was given a value of one regardless of position in the list of contributors.
2. **Arithmetic Mean.** Each author or institution was given a value of one divided by the number of contributors. If the institution appeared more than once, its score was summed.
3. **Geometric Mean.** Each author or institution was given a value depending upon the position in the list of contributors. For example, the first author of three is given a value of $3/(1+2+3)$, the second author is given a value of $2/6$, and the third author is given a value of $1/6$. If the institution appeared more than once, its score was summed. A higher ranking with a geometric mean indicates that the author has been a primary contributor to the research or he has fewer co-authors.

There are three strengths to this analysis:

1. **Coverage.** Many more journals were reviewed than in earlier studies.
2. **Timeliness.** The prior study ended in 1996. This study's analysis ended in 1998.
3. **Weighting.** Three author and institution weighting schemes were employed. In particular, a geometric mean may give a more accurate indication of each participant's contribution to the research.

There are several limitations with the analysis, however:

1. **Human Error.** Some papers may have been omitted or overlooked inadvertently.
2. **Classification Error.** Some subjectivity is involved in classifying GSS research. Some articles may be only tangential to the area, while others may include technology not deemed to be included in the category (e.g., email, bulletin boards, etc.)
3. **Journal Gaps.** Every attempt was made to seek out articles related to GSS in the journals during the period specified. However, some issues could not be located.
4. **Limited Coverage.** The surveyed period did not include any work from the 1980s. In addition, some journals that include GSS research may have been omitted, and no book chapters, non-refereed journals, or conference proceedings were included.

5. **No adjustment for quality.** No attempt was made to adjust the rankings based upon the quality of the journals. All refereed journals were given equal weight.
6. **Page count.** Some articles are much longer than others, but no adjustment was made for the total number of pages.

After analyzing the 43 journals, an attempt was made to discriminate further among the identified top 10 authors and institutions by reviewing their online curricula vitae, if available. This added an additional 43 journals which included GSS research, but these were not scanned for additional articles beyond those found in the vitae.

RESULTS

The top 10 GSS authors and institutions are shown in Table 4 and information about the researchers is provided in Appendix 2.

Immediately apparent is the rise of Aiken and the University of Mississippi in the rankings from the prior study. This can be attributed to three factors:

1. **Period Covered.** All of the authors besides Aiken listed in the prior study had begun publishing in the 1980s, and this study was restricted to the 1990s. Thus, many publications from these authors and institutions were omitted.
2. **Extended Coverage.** While many of the leading authors in the prior study tend to concentrate their publications in what are commonly-believed to be the highest quality journals, Aiken has opted to publish in a wider variety of outlets, emphasizing quantity over quality.
3. **Co-authors.** Aiken has included three others from the University of Mississippi in many of his papers (Martin, Paolillo, and Vanjani), thus increasing these authors' and the institution's counts.

The top GSS authors have strong ties with two institutions. Aiken, Briggs, Dennis, and Valacich obtained their Ph.D.s in MIS from the University of Arizona, and Nunamaker, Vogel, and George are or have been professors at the University. In addition, Aiken, Martin, and Paolillo are professors at the University of Mississippi and Vanjani obtained his Ph.D. in MIS from this institution.

Three institutions (Colorado, Texas, and New York) have been eliminated from the top 10, three have appeared (Maryland, California State, and Queens), and two have dropped down significantly in the rankings (Minnesota and New Jersey).

Table 4. Top 10 Authors and Institutions

<u>Authors</u>	<u>Geometric</u>	<u>Authors</u>	<u>Arithmetic</u>	<u>Authors</u>	<u>Normal</u>
1. Milam Aiken	32.0	Milam Aiken	25.2	Milam Aiken	57
2. Alan Dennis	12.9	Jay Nunamaker	12.0	Jay Nunamaker	41
3. Jay Nunamaker	9.3	Alan Dennis	10.8	Alan Dennis	28
4. Joseph Valacich	9.1	Joseph Valacich	9.1	Joseph Valacich	26
5. Maryam Alavi	4.2	Douglas Vogel	5.3	Douglas Vogel	20
6. Douglas Vogel	3.7	Maryam Alvi	4.3	Jeannette Martin	11
7. Joey George	3.2	Jeannette Martin	3.6	Joseph Paolillo	10
8. Robert Briggs	3.0	Joseph Paolillo	3.2	Mahesh Vanjani	9
9. Jenette Martin	2.6	Mahesh Vanjani	3.1	Robert Briggs	9
10. Mahesh Vanjani	2.5	Joey George	2.9	Joey George	7
<u>Institutions</u>	<u>Geometric</u>	<u>Institutions</u>	<u>Arithmetic</u>	<u>Institutions</u>	<u>Normal</u>
1. University of Mississippi	51.4	University of Mississippi	51.1	University of Arizona	60
2. University of Arizona	40.6	University of Arizona	42.5	University of Mississippi	55
3. Indiana University	10.0	Indiana University	9.7	Indiana University	22
4. University of Georgia	7.3	University of Georgia	7.5	University of Georgia	15
5. National Univ. of Singapore	6.0	National Univ. of Singapore	5.8	National Univ. of Singapore	7
6. University of Maryland	4.9	University of Maryland	4.8	University of Maryland	7
7. Queen's University, Canada	3.8	Queen's University, Canada	3.8	Queens University, Canada	6
8. University of Minnesota	3.2	Univ. of British Columbia	3.0	California State, San Marcos	5
9. Univ. of British Columbia	3.0	University of Minnesota	3.0	University of Minnesota	5
10. New Jersey Inst. of Technology	2.9	New Jersey Inst. of Technology	2.8	University of British Columbia	5

In addition, the papers were analyzed based upon the type of research used, and the results are summarized in Table 5. The vast majority of GSS research appears to be based upon lab experiments using groups of less than eight in synchronous meetings.

Table 5. Type of Research Analysis

<u>Type</u>	<u>Count</u>	<u>Percentage</u>
Synchronous meetings	97	95%
Asynchronous	5	5%
Meetings (<8 participants)	50	70.4%
Meetings (> participants)	21	29.6%
Lab Experiments	59	74.7%
Field Experiments	20	25.3%

Table 6 shows the journals with the most articles on GSS during the 1990s. The *Journal of MIS* is the clear leader in this field with 49 papers identified, followed by *Decision Support Systems*, *Information and Management*, and *MIS Quarterly*. *Management Science* and *Information Systems Research* tied for fifth place with six articles each, less than half of the fourth-place entry, and therefore, were not included on the list.

Table 5. Leading Journals for GSS Research (236 papers total)

<u>Journal</u>	<u>Count</u>	<u>Percentage</u>
Journal of MIS	49	20.8%
Decision Support Systems	35	14.8%
Information and Management	33	14.0%
MIS Quarterly	14	5.9%
Total:	131	55.5%

CONCLUSIONS

This study provides an update of leading authors and institutions in GSS research. While the University of Arizona remains a major influence in the field, the University of Mississippi has increased its ranking significantly. In addition, based solely upon the quantity of GSS publications over the last decade, Professor Aiken may now be the research leader in the area. Other author and institution rankings have changed, but many appear on the top ten list from a similar study conducted two years earlier.

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APPENDIX 1: Journals Reviewed (listed alphabetically)

Academy of Management Journal
ACM Transactions on Information Systems
American Journal of Sociology
American Psychologist
American Sociological Review
Behavioral Science
Communications of the ACM
Computer Journal
Computing Reviews
Computing Surveys
Data Base
Decision Sciences
Decision Support Systems
Harvard Business Review
Human Factors
Human Relations
Information and Management
Information Management
Information Systems Management
Information Systems Research
International Journal of Information and Management Sciences
International Journal of Intelligent Systems in Accounting, Finance & Management
International Journal of Management
Journal of Applied Psychology
Journal of Business Communications
Journal of Computers and systems Sciences
Journal of Human Resources
Journal of Management Information Systems
Journal of Systems and Software
Journal of Systems Management
Management Science
MIS Quarterly
OMEGA: International Journal of Management Science
Organization Dynamics
Organizational Behavior & Human Decision Processes
Pacific Sociological Review
Public Administration Quarterly
Sloan Management Review
Sociological Inquiry
Technological Review
Transactions on Knowledge and Data Engineering
Transactions on Pattern Analysis and Machine Intelligence
Transactions on Software Engineering

APPENDIX 2: Information on Leading Authors

Milam Aiken is an associate professor of MIS at the School of Business at the University of Mississippi and his research interests include GSS and neural networks. Email: maiken@bus.olemiss.edu Web: www.bus.olemiss.edu/maiken/aiken.htm

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Jeanette Martin is an associate professor of Business Communications at the University of Mississippi. Her research interests include Intercultural Communications, Translation in Business, GSS, and Environmental Communications. Email: jmartin@bus.olemiss.edu Web: <http://www.bus.olemiss.edu/>

Jay Nunamaker is Regents and Soldwedel Professor of MIS, Computer Science, and Communication and Director of the Center for Management of Information at the university of Arizona. He was a faculty member at Purdue University prior to founding the MIS department at the University of Arizona in 1974. Under his leadership for 20 years, the department has become known for its expertise in collaboration technology and the technical aspects of MIS. Email: nunamaker@bpa.arizona.edu Web: <http://www.bus.olemiss.edu/>

Joseph Paolillo is a professor of Management at The University of Mississippi. His research interests include GSS, strategic management, organizational theory, and health care management. Email: jpaolillo@bus.olemiss.edu Web: <http://www.bus.olemiss.edu/>

Joseph Valacich is the Hubman Distinguished Professor of MIS at Washington State University, Pullman. His research interests include GSS and technology-mediated learning. Email: jsv@wsu.edu Web: <http://www.cbe.swu.edu/profiles/profile.asp?last=Valacich&first=Joe>

Mahesh Vanjani is an assistant professor of IS and Communications at Georgia College and State University. His research interests include GSS, Total Quality Management, and neural networks. Email: mvanjan@mail.gcsu.edu Web: http://www.gcsu.edu/acad_affairs/school_business/faculty/Vanjani1.html

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